DOCUMENT RESUME

ED 339 025 CS 010 767

AUTHOR Mavrogenes, Nancy; And Others
TITLE A Comparative Study of Three Methods of Promoting Literacy in Kindergarten and First Grade, 1987-1988.
INSTITUTION Chicago Public Schools, Ill.
PUB DATE 89
NOTE 38p.
PUB TYPE Reports - Research/Technical (143)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS Comparative Analysis; *Free Writing; Grade 1; *Instructional Effectiveness; Kindergarten; Primary Education; Reading Skills; *Writing Instruction; Writing Research; *Writing Skills
IDENTIFIERS Chicago Public Schools IL; Emergent Literacy; *Writing to Read Program

ABSTRACT

Intended to determine whether, given the expense of the commercial Writing To Read (WTR) program, equal or better results could be obtained through other means, a study assessed the effectiveness of three methods of promoting composition in kindergarten and first grade classrooms. Three groups of kindergarten and first grade students from low income Black and Hispanic families participated in the study. The IBM WTR group utilized computers, workbooks, and manipulatives to nurture reading and writing skills in a logical sequential format. The free writing group used a whole language approach based on emergent literary research in which children are encouraged to write anything they want in whatever way they are able. For the control group, composition was taught according to the "Handbook for Written Composition, Kindergarten-Grade 8" disseminated to all teachers in the system. Results indicated: (1) at the kindergarten level, the free writing group significantly surpassed both other groups in assessments of encoding, content, word attack, and spelling; (2) at the first grade level, the WTR group performed significantly higher than the control group on word analysis and invented spelling; and (3) all classes that were encouraged to write freely and use invented spelling scored higher in content. Results suggested that free writing should be stressed in kindergartens and first grades, and that although WTR appears to help children's word analysis skills, a pencil and paper approach seems to improve more than just these skills. (Seven tables of data are included; 27 references are attached.) (PRA)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

F. Schuster

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☐ This document has been reproduced as received from the person or organization originating it

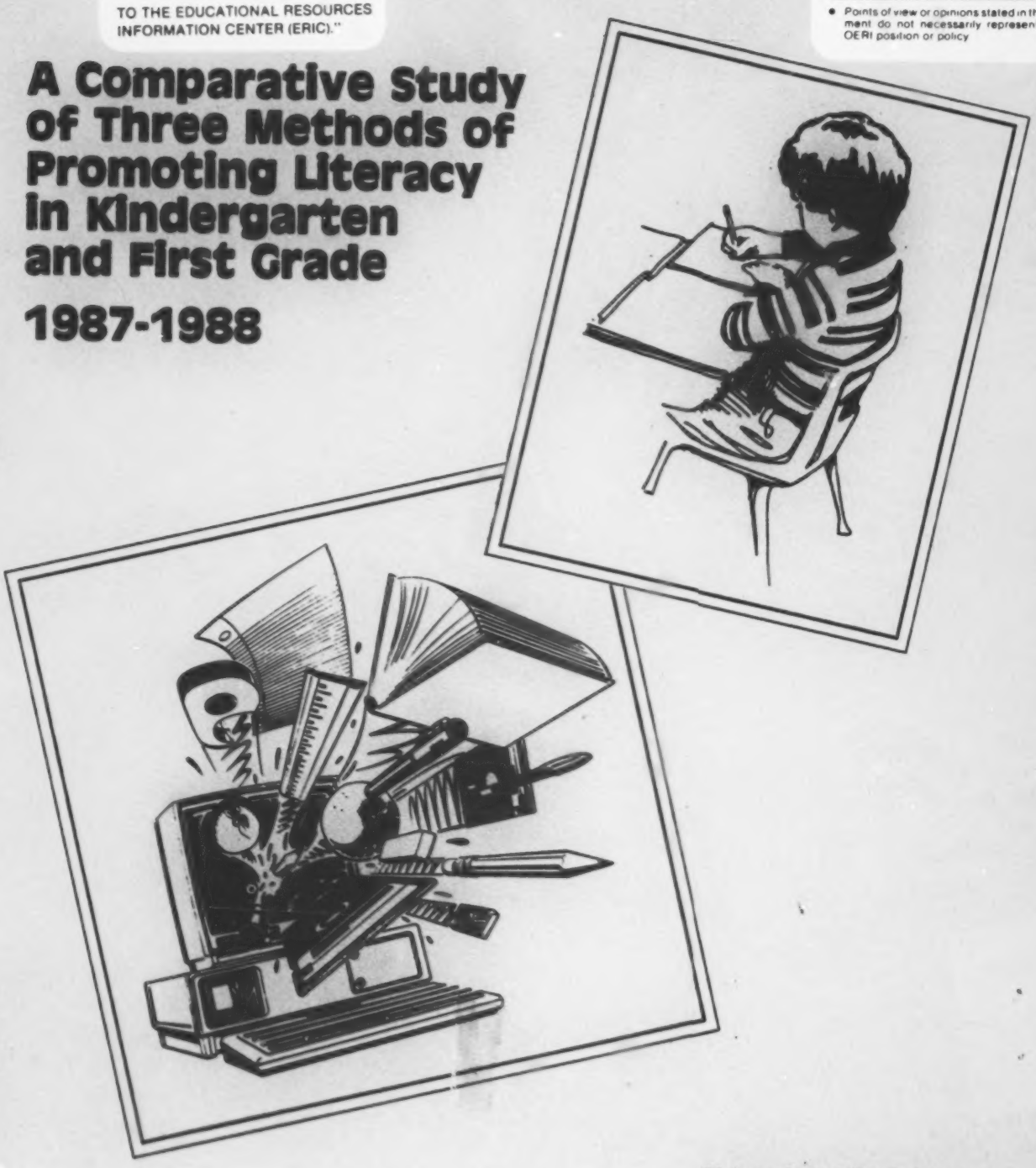
☐ Minor changes have been made to improve reproduction quality

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy

ED339025

A Comparative Study of Three Methods of Promoting Literacy in Kindergarten and First Grade

1987-1988



Chicago Public Schools

BEST COPY AVAILABLE

AS010767

A COMPARATIVE STUDY OF THREE METHODS OF PROMOTING LITERACY IN KINDERGARTEN AND FIRST GRADE

Prepared by
Nancy Mavrogenes, Mavis Hagemann, Trudy Wallace
Bureau of Program Evaluation
Department of Research, Evaluation and Planning

TED D. KIMBROUGH
General Superintendent of Schools

CHICAGO PUBLIC SCHOOLS

BOARD OF EDUCATION OF THE CITY OF CHICAGO

Clinton Bristow, Jr., President
Pamela A. Lenane, Vice President

Grady Bailey, Jr.
Stephen R. Ballis
Saundra Bishop
Florence B. Cox
Juan S. Cruz
Patricia A. Daley
The Rev. Darryl F. James
Rev. Nathaniel Jarrett
Albert N. Logan
Bertha G. Magaña
Anna Mustafa
Ashish Sen
Maria J. Vargas

A Comparative Study of Three Methods of Promoting Literacy in Kindergarten and First Grade 1987-88

Nancy Mavrogenes, Evaluation Specialist
Department of Research, Evaluation and Planning
Chicago Public Schools
1819 West Pershing Road, 4 West
Chicago, IL 60609

Instructional Program Evaluation
"This award is granted to Nancy Mavrogenes, Mavis Hagenaur and Trudy Wallace."

It is the policy of the Board of Education of the City of Chicago not to discriminate on the basis of race, color, creed, national origin, religion, age, handicap unrelated to ability, or sex in its educational program or employment policies or practices.

Inquiries concerning the application of Title IX of the Education Amendments of 1972 and the regulations promulgated thereunder concerning sex discrimination should be referred to the Title IX Coordinator, Board of Education of the City of Chicago, 1819 West Pershing Road, Chicago, Illinois 60609.

CONTENTS

Program Facts v
Summary vii

INTRODUCTION 1

PURPOSE OF STUDY 2

PART I

THE STUDY 3

Groups 3

Participants 4

Assessment 5

Procedure and Data Collection 6

Data Analysis 6

Results 7

PART II

DISCUSSION 15

PART III

RECOMMENDATIONS 19

PART IV

REFERENCES 22

APPENDIX

List of Participating Schools and Principals 24

LIST OF TABLES

1. Demographic Characteristics of Schools 4
2. Kindergarten Mean Scores in Writing, Reading, and Spelling 7
3. First Grade Mean Scores in Writing, Reading, and Spelling 8
4. Kindergarten Mean Scores by School 9
5. First Grade Scores by School 10
6. Kindergarten Observations and Interviews 11
7. First Grade Observations and Interviews 13

PROGRAM FACTS

Title: **A COMPARATIVE STUDY OF THREE METHODS OF PROMOTING LITERACY IN KINDERGARTEN AND FIRST GRADE, 1987-1988**

Program Purpose:

- To determine whether, given the expense of the commercial WTR program, equal or better results could be obtained through other means

Program Features:

- Served students from low-income, minority families, predominately black and Hispanic
- Operated in 16 schools with similar demographic characteristics
- Applied three instructional methods for promoting literacy to five designated groups (three kindergarten and two first grades)
    1. *Writing to Read*--using computers, workbooks, and manipulatives to develop reading and writing skills (K-1)
    2. *Free Writing*--employing open-ended writing tasks and total acceptance of whatever the children produced according to whole language and emergent literary research (K only)
    3. *Handbook for Written Composition*--incorporating writing instruction as part of a total language approach (control group, K-1)
- Employed three assessment measures to determine student reading and writing competence at the end of the school year:
    1. Standardized tests
    2. Spelling tests
    3. Writing samples on common topics

Grade Levels Served: Kindergarten and first grade (three kindergarten and two first grade groups = five groups)

Number of Students Served:	500 (100 in each of the 5 groups distributed among 16 participating schools
Staffing:	15 kindergarten teachers 8 first grade teachers Total: 23 teachers among 16 schools Staff: Bureau of Computer Education Staff: Department of Research, Evaluation and Planning
Location:	16 elementary schools and/or child-parent centers as follows: *Writing to Read*: John C. Haines, James Madison, Wolfgang A. Mozart, Josiah L. Pickard, Carter G. Woodson, Elihu Yale *Control*: Michael Faraday, George Gershwin, J.W. von Goethe, Charles Hammond, John T. McCutcheon *Composition*: Jen Jensen/Dorie Miller Child Parent Center, John A. Komensky, William H. King/Charles Dickens Child Parent Center, George Manierre/Catherine Ferguson Child Parent Center, Lois Nettelhorst
Program Duration:	1987-1988 school year
Funding Source:	Chicago Board of Education

EXECUTIVE SUMMARY

The purpose of this study was to assess the effectiveness of three methods of promoting composition in kindergarten and first grade classrooms. Three groups, each using a different method, participated in the study: 1) the IBM Writing to Read (WTR) group utilized computers, workbooks, and manipulatives to nurture reading and writing skills in a logical sequential format; 2) the rationale of the free writing group was based on whole language and emergent literary research in which children are encouraged to write anything they want in whatever way they are able; and 3) for the control group, composition was taught according to the Handbook for Written Composition, Kindergarten-Grade 8 which was disseminated to all teachers in the system by the Department of Curriculum in the fall of 1987. The free writing group included only kindergartners. Five schools, matched on demographic characteristics, were chosen for each of the three kindergarten groups and four for each of the two first grade groups. The students were predominantly from low income black and Hispanic families. All five groups consisted of approximately 100 children each; the number of schools involved in the study was 16. The primary research question was: given the expense of the commercial WTR program, could equal or better results be obtained through other means?

At the end of the school year, three methods were utilized to assess students' competence in reading and writing. The first was standardized tests: for kindergartners the word attack subtest of the Comprehensive Tests of Basic Skills, Form U, Level B, and for first graders the word analysis and reading comprehension subtests of the Iowa Tests of Basic Skills, Form 7. The second method of assessment was a spelling test of ten words which students were to spell as best they could (invented spelling); first graders also had another ten-word list they were to spell correctly. The third method of assessment was to collect writing samples on a common topic from all students. An adult (teacher or evaluator) transcribed kindergartners' writing as they read it out loud. First graders received a single score but kindergartners were scored on both content and encoding (the ability to match letters with sounds so that the words could be read). Observations of composition lessons in all classrooms were also made prior to the testing at the end of the school year.

The principal findings of this study were as follows:

- At the kindergarten level, the free writing group significantly surpassed both other groups on all four measures: encoding, content, word attack subtest, and spelling test. In addition, the WTR group scored significantly higher than the control group on three measures: encoding, word attack subtest, and spelling test.

- At the first grade level, the WTR group performed significantly higher than the control group on two of the five measures: the word analysis

subtest and the invented spelling test. In word analysis 33% of the WTR group were in the top quartile while only 4% of the control group were. In reading comprehension, both groups scored above the national norm of 1.7.

. An analysis of individual classroom scores showed that all classes which had been encouraged to write freely and utilize invented spelling scored higher in content on their writing samples than classes where correct spelling had inhibited composition. This was true even when kindergarten children were not able to encode but only drew pictures or "scribbled."

. Observations of classrooms and interviews with teachers revealed differences between kindergarten groups: 1) only in the free writing group did all teachers transcribe children's writing and listen to them read it out loud; 2) only in the free writing group was no copying done from the board but all children were allowed to write freely in order to express their own thoughts; and 3) only in the free writing group were all children consistently allowed to use their own invented spelling. Two further differences were that four of the free writing classes were All-Day Kindergartens, and all the free writing teachers had had different kinds and amounts of inservice training from the teachers in the other two groups.

. At the first grade level, differences between groups revealed in observations and interviews were that WTR children were allowed to work and talk together more often than control children, more of their writing was displayed around their rooms, they had more adults in the room to supervise and encourage them, and they appeared more interested in their writing. WTR teachers had also had more inservice training about writing than control teachers, whose only training had been the guidance offered in the handbook and, in two cases, the encouragement of a principal or a reading teacher.

Based on the results found in this investigation, the following recommendations were made:

. **Free writing should be stressed in kindergartens and first grades.** It should not be a mere incidental and occasional part of the curriculum. Incorporated properly, in a print-rich environment where writing is shared with an audience, it provides a purposeful integration of all strands of language arts: writing, reading, speaking, and listening. As children learn to become phonetic spellers, they not only express their own ideas and learn to communicate with others, but they also learn to read by segmenting sounds in words and matching appropriate letters to each sound as they write the words.

. **In order to foster both phonemic awareness and a sense of story, teachers should begin with story dictation in preschool and then actual composition practice and transcription in kindergarten.** The ability to compose in writing means the ability to utilize phonetic or invented spelling as well as the ability to create sensible and logical content.

- **Extended inservice training in composition and monitoring should be provided for teachers of young children to move these children toward literacy.** This recommendation is supported by both the literature on inservice training and the results of this study which showed that the kindergarten free writing group outperformed the other groups. Teachers in the free-writing group had training which differed in amount and kind from that offered teachers in the other two groups. It extended over a longer period (two years) and not only dealt with the writing process but also offered practical suggestions for implementation.

- **WTR does indeed appear to help children's word analysis skills, but a pencil and paper approach seems to help more than just these skills.** An expensive program with computers does not seem necessary to help young children learn to compose, to read, and to spell.

- **In fairness to WTR, another comparative evaluation should be made at the end of its second year of implementation (1989).** Because of WTR implementation problems, other researchers conducted their studies during a second year of implementation, although in some reports second-year results have corroborated those of the first year.

- **Finally, certain procedures should be followed in helping young children learn to compose:**

  1) children should be allowed to write freely and express their own thoughts so that they remain interested in what they do and learn to communicate with others;

  2) they should be encouraged to use their own spellings so that their phonics skills are fully utilized and their fluency is not interfered with by an undue concern with correctness;

  3) teachers should transcribe children's writing as they listen to them read it out loud so that children understand the relationship between sound and print and develop a sense of audience;

  4) children should put the date on all their writing and their samples should be kept together in individual folders so that teachers and parents can see the progress made;

  5) children's writing should be displayed at their own eye level so that other children can read and react to the writing;

  6) classrooms should be immersed in print: library books, experience stories, Big Books, children-made books, library cards, writing materials, labels, letters to and from the teacher, stories read and dramatized, free reading corners, writing in all learning centers, pen-pals and authors of the week.

INTRODUCTION

The National Assessment of Educational Progress (1981, 1987) has shown that American school children have trouble reading, writing, and thinking critically except at the simplest levels. In an attempt to address this problem, the General Superintendent of the Chicago Public Schools established a new systemwide objective for elementary schools: "to implement a policy requiring all students to prepare written compositions." Several efforts to promote composition have been established at the kindergarten and first grade levels. Ten schools were chosen by the Field Assistant Superintendents to receive the IBM Writing to Read (WTR) program on an experimental basis. This multimedia system is designed to teach children how to write what they can say and to read what they write. In some kindergartens free writing has been encouraged by the Bureau of Early Childhood Programs supported by the Department of Research and Evaluation along the lines suggested by recent research in emergent literacy. In this activity, children write anything they want in whatever way they are able, even if at first they can only "scribble." A third effort to promote composition in the Chicago Public Schools has been the creation and dissemination in the fall of 1987 of the Handbook for Written Composition, Kindergarten-Grade 8. This publication specifies objectives and topics for teaching composition at each grade level.

Studies of the efficacy of WTR have produced varied results. The earliest reports on WTR described gains in reading but did not mention writing results (Martin, 1984). The Educational Testing Service study commissioned by IBM (Murphy and Appel, 1984) found that the WTR students surpassed the control group in both reading and writing at the kindergarten level and in writing at the first grade level. There was no significant difference between groups on spelling. Naron and Sierra (1988) and Sierra and Naron (1988) concluded that WTR made a difference with kindergarten in both reading and writing but not with first graders. In Levinson and Lalor (1987) WTR was effective in teaching both groups to write and first graders to spell but made no difference in reading performance. Zenke and Keatley (1988) found that WTR kindergartners gained more on readiness measures for first grade than non-WTR students, but no tests of significance were reported for these results. All these studies were conducted with heterogeneous populations.

Research in emergent literacy has consisted mostly of case studies, with implications spelled out for classroom practice. Naron and Sierra's empirical study (1988) assessed the comparative effectiveness of allowing kindergartners to write freely. In this case the "writing process" students, along with the WTR group, performed significantly better on writing samples than the traditional or control group, but no attempt was made to assess reading achievement. Another recent study (Clarke, 1988) compared the progress of first-graders encouraged to use invented spelling with those encouraged to use traditional spelling in their creative writing. More of those using invented spelling were able to write on their own in the early months, their productions were significantly longer, and on posttests they had significantly greater skill in spelling and word analysis in reading. Most of these gains were accounted for by initially low achieving children.

PURPOSE OF THE STUDY

This study assessed whether adding WTR to a kindergarten and first grade literacy program increased children's reading, writing, and spelling skills. WTR was compared to two other methods of teaching young children to compose: 1) the use of free writing and 2) the use of a citywide composition handbook. Four questions were posed. The primary question is one asked by other researchers: "Given the expense of WTR in personnel, time, hardware, and materials, could equal or better results be obtained through other means?" (Wallace, 1985, p. 23). A second question is whether free writing at the kindergarten level is effective in helping children emerge into literacy. A third consideration concerns how much and what kind of teacher inservice training is necessary to successfully implement a literacy program for young children. The final question considered is whether the programs and curricula were implemented as designed.

THE STUDY

Groups

There were three kindergarten and two first grade groups in this study. Five schools were selected for each kindergarten group and four for grade one. The kindergarten and first grade WTR children went for an hour a day for one semester or more to a special learning center managed by their classroom teachers and organized into five learning stations: 1) computers with speech attachments for learning 42 phonemes; 2) work journals for reinforcement of the computer lessons; 3) a listening library for listening to children's literature on tapes, 4) writing/keyboarding for free writing both on computers and at tables; and 5) making words for playing phoneme-based games and using hands-on materials. The goal was to build on students' natural language development in an active environment and to use their imaginations to nurture their reading and writing skills in a logical sequential format. The five WTR schools were selected by program staff because they had implemented the WTR program as designed at both the kindergarten and first grade levels. Three of the WTR classes, however, seemed not to have encouraged free writing in the manner suggested by the program directives. Four schools began their programs in November 1987 and the fifth in January 1988; the kindergarten program was scheduled for the second semester only (1988).

Teachers in the control group, both kindergarten and first grade, were supposed to be teaching composition according to the Handbook for Written Composition, Kindergarten-Grade 8 which was disseminated to all teachers in the system by the Department of Curriculum in the fall of 1987. This handbook provides examples, objectives, suggested topics, and some discussion for each grade level. It incorporates writing instruction as part of a total language approach in which children are to be provided with rich and meaningful experiences to develop oral language competencies and to promote an awareness of the print-to-speech relationship. Only two kindergarten control classes appeared to have begun the teaching of composition and that was at the beginning of the second semester. Two of the first-grade control classes had been teaching composition all year (1987-1988), one began in February, and the fourth in April. Control classes were selected to match the WTR and free writing classes on the basis of economic and racial variables.

The free writing group included only kindergartners. The free writing approach is based on whole language (Butler and Turbill, 1985) and emergent literacy research (Teale and Sulzby, 1986). The recommendations are for a rich and purposeful print environment with open-ended writing tasks, total acceptance of whatever the children produce, and writing shared with a supportive audience. In this way children will progress from drawing only and scribbling to using their own invented spelling, in which they demonstrate increasing knowledge of sound-letter correspondence. The goals are to promote fluency, encourage risk-taking in a failure-free environment, and show children that reading and writing are pleasurable means of communication in which thoughts are translated into symbols which mean something to other people. Teachers in four of the five classes in this group had been teaching composition all year and the fifth had begun in December 1987. These classes were chosen for this study because they were observed by the researchers as having implemented this kind of approach to composition.

Participants

Table 1 presents the demographic characteristics of the schools which participated in this study. The three groups were matched on economic and racial factors. The percent of children enrolled from low income families was computed from free and reduced lunch information. The means for each group are similar (94%, 93.8%, and 93.4.%). The racial composition of each group is over half black, about a third Hispanic, and the rest white and Asian, with white being the smallest percentage (3-5%).

Table 1

Demographic Characteristics Schools

Group/School	Total No. of Children Enrolled	% of Enrollment from Low Income Families	Racial Composition % White	% Black	% Hispanic	% Asian
WTR						
A	692	99.8	-	61	-	38
B	1039	95.3	14	4	78	4
C	705	72.7	-	100	-	-
D	818	100.0	-	100	-	-
E	1000	96.1	5	-	95	-
F	762	100.0	-	100	-	-
Group Mean	$\bar{x} = 1003$	94.0	3	61	29	7
CONTROL						
G	716	96.3	8	50	11	28
H	934	91.2	16	5	78	-
I	844	99.6	-	100	-	-
J	733	82.8	-	100	-	-
K	956	99.2	3	-	96	-
Group Mean	$\bar{x} = 837$	93.8	5	51	37	6
FREE WRITING						
L	662	100.0	-	99	1	-
M	550	86.6	1	63	36	-
N	700	100.0	-	100	-	-
O	553	92.6	1	1	98	-
P	498	87.6	25	38	32	4
Group Mean	$\bar{x} = 593$	93.4	5	60	33	1

I would have liked to have seen some data on average class size & get the impression that the writing groups from both schools were small. Is that true?

Each kindergarten group consisted of five classes and each first grade group of four classes. Because of the failure of ear phones in one WTR school, another school had to be substituted in the kindergarten WTR group. Although this new school was not one of the 10 schools especially chosen for WTR, it had purchased the program on its own and was the only WTR kindergarten available to be substituted. Each of the three kindergarten groups and the two first grade groups consisted of approximately 100 children for a total number of subjects of about 500. All the schools in the study offer prekindergarten, except one WTR school. These prekindergarten classes are of various types: state prekindergarten, Head Start, Chapter 1, or Child Parent Center (CPC) classes; all types serve both three and four-year-olds.

Assessment

Three methods of assessments were utilized to measure students' competence in reading and writing. The first method was the use of standardized tests. The kindergarten students were measured on the word attack subtest of the Comprehensive Tests of Basic Skills (CTBS), Form U, Level B. This subtest assesses students' recognition and understanding of sounds of letters in words, word forms, and recognition of sight words. First-grade students were measured on the word analysis and reading comprehension subtests of the Iowa Tests of Basic Skills (ITBS), Form 7. The word analysis subtest assesses students' decoding skills and knowledge of grapheme-phoneme relationships; the reading comprehension subtest assesses students' knowledge of reading facts and their ability to make inferences and generalizations.

The second method of assessment was a spelling test. The ten-word kindergarten test was taken from Morris (1986, p. 32). Children were encouraged to spell the words as best they could. Such a test of invented spelling has been shown in Morris and Perney (1984) and Morris (1983) to be a good measure of phonemic awareness, orthographic awareness, and word knowledge. "Children must first segment the sounds in the word and then match an appropriate letter to each sound as they write the word; ...such practice in manipulating and sequencing sound-letter relationships in the act of writing undoubtedly has a positive, carry-over effect to the learning-to-read process" (Morris and Perney, 1984, p. 455). The first-grade spelling test had two parts: a) the same ten-word test of invented spelling given to the kindergartners, and b) another ten-word list which the students were to spell correctly. This second list was taken from the ETS Study (Murphy and Appel, 1984); it was derived from words common to four first-grade spelling series and the Dolch word list. Two words important in first-grade writing were substituted for two words on the ETS list, one of which had been included on the invented spelling test. Each word was said to the students twice and used in a sentence.

The third method of assessment was to collect writing samples from all subjects. A common topic was used which was taken from Murphy and Appel (1984). This activity asked the children to finish a story begun with this starter sentence: "One day I found a magic hat." A sample story was read to the children as in the ETS study. Because the kindergarten stories were not always legible, the children read them to an adult (teacher or evaluator) who transcribed them.

Procedures and Data Collection

The ITBS was administered to first graders by the classroom teachers as part of the citywide testing program. The CTBS subtest, chosen as the most appropriate test to measure young children's ability to recognize letter-sound correspondence, was administered to kindergartners by three of the four evaluators who conducted this study. The spelling tests and the writing assessment were administered by these same evaluators. All assessments were administered at the end of the 1987-1988 school year, the ITBS during April and the others during the first half of June.

The procedure used in administering most of the tests and collecting the data differs from the ETS evaluation (Murphy and Appel, 1984): in the present study outside evaluators did the administration and collection, not the classroom teachers. Naron and Sierra (1988) also had outside evaluators collect writing samples, calling this an "important difference" from the ETS evaluation. The evaluators in this study reached a detailed consensus on procedures to assure uniformity in administration and collection. "In addition, the presence of outsiders offered some assurance that the teachers in fact did not assist their students" in the assessments (Naron and Sierra, 1988, p. 7).

Observations of all classrooms were made by five evaluators, four from the Bureau of Program Evaluation of the Department of Research and Evaluation and one from the Bureau of Computer Education of the Department of Vocational and Technological Education. The Computer Education evaluator observed the WTR classrooms. The observations, conducted at the end of May 1988 and beginning of June, lasted at least one hour each and included some interviewing of the teachers. All the observations had been especially scheduled so as to encompass a typical composition lesson.

Data Analysis

ITBS results were compiled by the Bureau of Tests and Measurement and are reported as grade-equivalent scores. All other tests were scored by the evaluators from the Bureau of Program Evaluation. The spelling tests were scored according to the scoring system described in Morris and Perney (1984). On the ten invented spelling words, the range for each word was from 0 (no sounds) to 1 (one correct sound, usually the first) to 5 (correct spelling), for a possible total score of 50. The ten correct spelling words were scored as either a 0 (incorrect spelling) or 1 (correct spelling).

For the kindergartners, the writing samples were evaluated by means of two six-point scoring scales. The first one, for content, was taken from Murphy and Appel (1984). The range of scores was from 0 (no response or one-word response) to 6 (well developed ideas, fully developed structure, logically connected and well organized ideas, varied sentence structure). The second scoring scale evaluated encoding, with the scores ranging from 0 (no letters) to 6 (readable spelling). Encoding mastery was evidenced by the ability to match letters with sounds so that the words could be read. The first-grade stories received a single score as in Murphy and Appel (1984). The range was from 0 (undecipherable, blank response, off topic) to 6 (well developed and fluent ideas, well organized and logical narrative, varied sentence structure, interesting plot or exceptional control of language).

Each paper was read separately by two evaluators, all of whom were experienced teachers. As a group the readers went over sample papers and agreed on the criteria. Each paper was identified by a code number so that the readers did not know which group they were reading. When the two readers did not agree on a score, they discussed the paper to come to an agreement. If this could not be reached, a third evaluator was asked to settle the score. Agreement was reached by two readers 92% of the time for kindergarten papers and 95% for first grade.

Results

Table 2 shows the mean scores in writing, reading, and spelling for the three kindergarten groups: WTR, control, and free-writing. Two general conclusions can be formed from the post-hoc analysis of the overall differences between groups. First, the free writing group significantly surpassed both other groups on all measures. Second, the WTR group scored significantly higher than the control group on three of the four measures (encoding, CTBS word attack subtest, and spelling test). An analysis by test showed the differences more specifically. Two scores were compiled for the writing samples: encoding (matching letters with sounds) and content. On encoding the free writing group surpassed both the control group ($p<.001$) and the WTR group ($p<.01$), and the WTR group surpassed the control ($p<.001$).

Table 2

Kindergarten Mean Scores in Writing, Reading, and Spelling

		Writing Samples[a]		Tests			
Group	N	Encoding	Content	N	CTBS Word Attack	N	Spelling
Range		0-6	0-6		0-32		0-50
WTR	101	2.35 (1.74)	2.32 (1.38)	104	19.67 (5.77)	104	14.00 (9.81)
Control	93	1.44 (1.31)	2.51 (1.36)	102	16.25 (7.29)	101	9.44 (9.44)
Free writing	108	3.02* (1.89)	3.32* (1.08)	102	21.99* (6.99)	101	18.08* (11.49)

Note. The asterisks indicate a significant mean overall difference ($p<.001$) among groups in favor of the free writing group. In addition, further analysis showed that the WTR group had significantly higher mean scores than the control group on three of the four measures: encoding ($p<.001$), CTBS word attack subtest ($p<.001$), and spelling test ($p<.01$).

[a]Standard deviations are in parentheses.

On content the free writing group surpassed both other groups ($p<.001$). On both the reading subtest and the spelling test the free writing group outscored WTR ($p<.05$) and the controls ($p<.001$). Also, on these two tests WTR outscored the controls ($p<.01$). The CTBS median percentiles were 57 for WTR, 35 for the control group, and 73 for the free writing group.

First grade mean scores in writing, reading, and spelling are reported in Table 3. Analysis of variance showed that the WTR group performed significantly higher than the control group on two of the five measures: the word analysis subtest and the invented spelling test. The WTR score for correct spelling was essentially the same as the control score even though the WTR invented spelling score was higher. The WTR score on word analysis was particularly high; in fact, 33% of WTR children scored in the top quartile on this subtest, compared with 4% of the control group. In reading comprehension, both groups scored above the national norm of 1.7.

Table 3

First Grade Mean Scores In Writing, Reading, and Spelling

			Reading Grade Equivalents			Spelling	
Group	N	Writing[a] Samples	N	Word Analysis	Comprehension	N	Invented	Correct
WTR	97	2.69 (1.49)	101	2.1** (1.16)	1.9 (0.77)	97	30.87* (13.26)	4.99 (2.89)
Control	86	2.69 (1.29)	96	1.4 (0.60)	1.9 (0.66)	90	27.46 (10.52)	5.03 (2.81)

*$p<.05$ **$p<.001$

[a]Standard deviations are in parentheses.

Scores of individual schools are presented in Tables 4 and 5. Each school's score represents one classroom. It is interesting to note that those children who had been given several or more opportunities to write freely had content scores on their writing samples well above the others (2.1 or higher). This group includes the control schools that had done some writing, all the free writing classes, and those WTR schools that had encouraged free writing as suggested in the program directives. Children in these schools received higher content scores even if they had not yet learned to encode at all but just "scribbled" or drew. It should also be noted that great variance exists between the schools within each group.

Table 4

Kindergarten Mean Scores by School

	Writing Samples		CTBS Word Attack	Invented Spelling	
School	Encoding	Content	Percentile	Score	Range
WTR					
A	1.4	2.8	35	10.1	0-22
B	3.5	2.8	57	15.9	0-36
C	3.0	3.8	68	18.0	0-40
D	1.4	1.1	38	6.9	0-17
E	2.4	1.7	73	17.6	0-36
Mean	2.4	2.3	57	14.0	0-40
Control					
F	2.0	2.2	35	10.3	3-30
G	1.2	3.2	42	5.6	0-25
H	1.3	1.9	35	7.0	0-17
I	2.2	3.6	73	19.3	0-32
J	0.4	1.2	13	1.5	0-07
Mean	1.4	2.5	35	9.4	0-32
Free writing					
K	3.0	2.8	76	18.0	3-30
L	3.0	3.4	42	13.0	5-27
M	5.3	3.7	86	25.4	7-48
N	1.5	2.6	78	14.0	0-29
O	1.8	3.9	35	16.1	0-50
Mean	3.0	3.3	73	18.1	0-50

Tables 6 and 7 present information obtained from observing all classrooms in this study and interviewing the teachers. There were only two similarities between the kindergarten groups (Table 6): 1) the existence of preschool classes at all schools except one, and 2) the mixed ability of all groups. Differences between the groups are especially striking: 1) only in the free writing group did all teachers transcribe children's writing and listen to

Table 5

First Grade Scores By School

	Writing	ITBS Median Grade Equivalent		Spelling Mean Scores	
School	Mean Score	Word Analysis	Comprehension	Invented	Correct
WTR					
A	2.9	2.1	1.9	32.2	6.0
B	3.3	2.7	2.1	38.1	5.9
C	2.9	1.0	1.4	30.2	4.9
D	1.8	1.7	1.9	20.3	3.2
Mean	2.7	2.1	1.9	30.9	5.0
Control					
E	3.5	1.2	2.1	29.9	6.2
F	2.1	1.3	1.5	28.2	3.8
G	2.4	1.8	2.5	25.2	6.2
H	2.3	1.2	1.6	25.2	4.2
Mean	2.7	1.4	1.9	27.5	5.0

them read it out loud, 2) only in the free writing group was no copying done from the board but all children were allowed to write freely in order to express their own thoughts, and 3) only in the free writing group were children consistently allowed to use their own invented spellings. Most of the free writing classes put the date on their writing. In both the free writing and WTR classes, children's work was kept in folders and children appeared interested in their writing. In all the WTR classes children were allowed to work and talk together and their writing was displayed around their classrooms. Two further differences were that four of the free writing classes were All-Day Kindergartens (ADKs), and all the free writing teachers had received different kinds and amounts of inservice training from the teachers in the other two groups.

At the first-grade level (Table 7), the differences between groups were not so extensive. WTR children appeared more interested in their writing than the control children, they were more often allowed to talk and work together, more of their writing was displayed around their rooms, and they had more adults in the rooms to supervise and encourage them. A difference also appeared in amount of inservice training. Although the control teachers had had no training, except for the guidance offered by the handbook, WTR teachers had had two days of training provided by IBM.

Table 6

Kindergarten Observations and Interviews

Activity	WTR Group	Control Group	Free Writing Group
Number of classes	5	5	5
Teachers' activities during writing period	Supervise and encourage group at writing table	Discipline, transcribe, keep on task, encourage	Circulate to individuals, urging them to elaborate and write down sounds; transcribe; listen to shared writing
Children's activities during writing period	Write freely 2 copy Morning Story 1 type words from book/cards 2 draw pictures 1, use manipulatives 5, listen to stories 3	Copy Morning Story 1 Only draw 3 Only draw with a few letters 1	Draw pictures 3 Write freely 5 Have writing transcribed 5 Share writing with class 3
Children invent spelling	Yes 2, No 3	Yes 1, No 4	Yes 5
Teacher gives correct spelling	Yes 1, No 2 Copying only 2	Yes 3, No 1 Copying only 1	No 5
Children interested in writing	Yes 5	Interested in drawing 4 Felt coerced 1	Yes 5
Children work and talk together	Yes 5	Yes 2, No 3	Yes 4, No 1
Children's work kept in folders	Yes 5	Yes 2, No 3	Yes 5 Folders contained 6-15 or more compositions
Children's writing displayed	Yes 5	Yes 2, No 3	Yes 3, No 2

Table 6 (cont.)

Kindergarten Observations and Interviews

Activity	WTR Group	Control Group	Free Writing Group
Print in room	Books, children's compositions, story starters, cycle words	Charts, shapes, colors, numbers, alphabet, not much children's work, few books	Colors, numbers, shapes, alphabet, labels, calendars, posters, children's work, groups, schedules, charts, lists, books
Adults in room	2-5	1	1-3
Amount of inservice training	Most teachers 10 hours (given by IBM on consecutive days)	All teachers none, but in 2 schools the principal or reading coordinator was committed to writing	4 teachers 2 or more 1 1/2 hour sessions plus monitoring over a two-year period
Schools offering preschool	Head Start 2, CPC 1 State Prekindergarten 1 Chapter 1 - 1, None 1	Head Start 4 State Prekindergarten 2 Chapter 1 - 1	CPC 3 State Prekindergarten 2
Date put on writing	Yes 2, No 3	Yes 1, No 4	Yes 4, No 1
Kind of class	Half-day 4 - All day 1	Half-day 5	Half-day 1 - All-day 4

Note: All classes were mixed ability except for two free writing classes, one of which was high and one low.

Table 7

First Grade Observations and Interviews

Activity	WTR Group	Control Group
Number of Classes	4	4
Teachers' activities during writing period	Supervise and encourage group at writing table	Monitor behavior, listen to reading of stories, encourage elaboration, check work
Children's activities during writing period	Putting stories on computer 2 writing stories 2, writing sentences 1, using manipulatives 3, listening to stories 2	Writing at least one page 4 Nervous about correct spelling 1
Children's spelling	Use invented spelling 2 Spell correctly 1 Only use posted cycle words 1	Use invented spelling 2 Spell correctly 2
Teacher gives correct spelling	Yes 2, No 2	Yes 1, No 2 Class uses dictionaries 1
Children interested in writing	Yes 4	Yes 3, No 1
Children work and talk together	Yes 4	Yes 3, No 1
Children's work kept in folders	Yes 3, No 1	Yes 3, No 1
Children's writing displayed	Yes 3, No 1	Yes 1, only copied work 2 only spelling papers 1

Table 7 (cont.)

First Grade Observations and Interviews

Activity	WTR Group	Control Group
Print in room	Books, children's compositions, story starters, cycle words	Alphabet, numbers, basal words, rules, spelling tests, Morning Story, books, children's compositions
Adults in room	1-3	1
Amount of inservice training	Most teachers 2 days (given by IBM)	None
Date put on writing	Yes 2, No 2	Yes 3, No 1

DISCUSSION

Although the WTR group significantly outperformed the control group on three of the four kindergarten measures and two of the five first-grade measures (Tables 2 and 3), the group that stands out is kindergarten free writing. Children in the free writing group significantly outperformed both other groups on every measure. Some reasons for this performance become evident from the observational data (Table 6). Only in these classes did all teachers transcribe children's writing and listen to them read it out loud. In this way two important aspects of composition were made clear: the relationship between sound and print and the sense of audience. Only in this group was no copying done during composition time, but all children were allowed to write freely in order to express their own thoughts. In this way, they remained interested in what they were doing and they learned to communicate with other people. Also, only in the free writing group were all children consistently allowed and encouraged to use their own spelling strategies (invented spelling) so that their phonics skills were fully utilized and developed and the fluency of their writing was not compromised by an undue emphasis on correctness. Most of the free writing classes had the children put the date on their writing and their work was kept in individual folders so that their progress could be seen and monitored.

Two further important differences between kindergarten groups might have influenced the test results. First, four of the five classes in the free writing group were ADKs; there were no ADKs in the control group and only one in WTR. Although these figures would appear to account in part for the differences in test results, research is not conclusive about the effects of ADK. It is the conclusion of the evaluators in this study, who have conducted hundreds of kindergarten observations, that the quality of the program, not time spent, determines kindergarten success. Other researchers offer supporting evidence. Goldring and Presbrey (1986) conducted a meta-analysis of evaluations of preschool programs. This analysis involved eight evaluation studies of programs for low-income black children aged two through five. The authors' conclusion was that "the treatment effects are quite robust" despite the wide diversities in lengths of intervention and ages at intervention (pp. 187-188). The reviews of research on all-day vs. half-day kindergarten provide further evidence (Karweit, 1987, 1988; Puleo, 1986, 1988; Scarr and Weinburg, 1986). On the one hand, these reviews come to a consensus that ADK "appears to produce beneficial short-term cognitive effects, especially for disadvantaged students" (Karweit, 1988, p. 19). On the other hand, however, the studies reviewed are criticized as being poorly designed, and, more important, the reviewers agree that "the type of instructional program provided may be even more important" than the added time (Karwait, 1987, p. iii). The real need is for "well-planned quality programs" (Puleo, 1988, p. 437), or, as Naron states (1981, p. 108), "It is the way time is used that is important."

A second difference is that the amount of inservice training offered to the teachers varied between groups. WTR teachers had two consecutive days of training provided by IBM. This training consisted of some discussion of theory and the writing process but focused mostly on the mechanics of the computers, the groups, and the workbooks. Control group teachers had no specific training in the teaching of composition apart from the handbook provided to all teachers in the system. In two of the control schools,

however, the principal or the reading coordinator was especially committed to teaching composition and thus gave their teachers some help. Four of the five free writing teachers were provided with specialized training in teaching composition and were monitored over an extended period either by a head teacher or coordinator from the Bureau of Early Childhood Programs. This training was offered several times over a two-year period and consisted of a thorough discussion of the writing process as well as practical suggestions for implementation. The reason for such training was that these kindergartens were part of government funded programs and thus were provided with more inservice. The fifth free writing class received composition instruction from the school reading teacher who was well versed in the emergent literacy research.

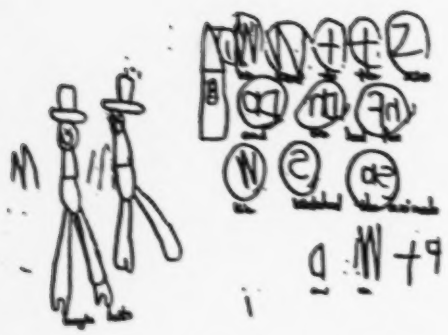
At both the first grade and kindergarten levels, the advantages of the WTR program become evident. The multisensory active environment appeals to children, and they are closely supervised and encouraged by a number of adults (Spillman and Lutz, 1988). The test results would indicate that this program is especially efficacious in teaching children word attack skills: in kindergarten WTR students achieved significantly higher than the control group on encoding, the CTBS word attack subtest, and the invented spelling test, and in first grade they achieved significantly higher than the control group on the word analysis subtest and the invented spelling test.

These results differ from both Murphy & Appel (1984) and Sierra and Naron (1988), who found the WTR group higher in reading in kindergarten but not in first grade. The results, however, would seem to agree with Sierra and Naron's conclusion that "WTR students may show an initial advantage in reading when the emphasis is on phonics but, as the emphasis shifts to comprehension, the initial advantage is lost" (p.9). It should also be noted that in the present study there were implementation problems connected with WTR's first year in the Chicago Public Schools: the writing table for free writing was not being used, a group did not participate in the program every day, or a teacher had no one else to help and therefore did not incorporate the computers. Both Sierra and Naron (1988) and Murphy and Appel (1984) mentioned similar first-year implementation problems and efforts to correct such problems during a second year.

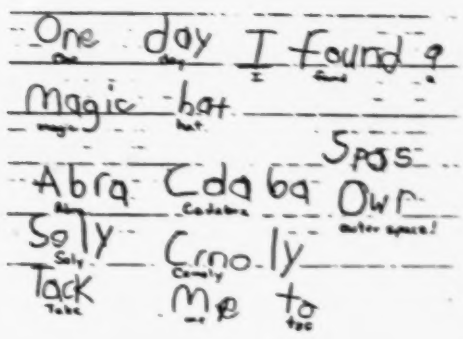
In this study the results for composition partially corroborate the findings of other quantitative investigations. On the writing samples the kindergarten free writing group significantly outperformed the other groups on both encoding and content. In addition, the kindergarten WTR group outperformed the control group on encoding. There were no significant differences between groups at the first grade level. In both the ETS study (Murphy and Appel, 1984) and Levinson and Lalor (1987), the WTR kindergartners and first graders scored significantly higher on the writing assessment than did students in traditional classes. In Naron and Sierra (1988) such a difference was found at the kindergarten level only. Also, in that study, no differences were found between the WTR and free writing students. A difference between studies is that here the encoding ability of kindergartners was assessed as well as content. This provides a look at children's knowledge of story schemata as well as their phonemic awareness. The number of kindergarten children who scored at the highest levels for content (5 or 6) were only six in the control group, four in WTR, and eight in the free writing group. These figures might provide additional evidence that WTR develops students proficient in phonics rather than comprehension (Sierra & Naron, 1988).

Three other differences exist between this and other studies. Here differences were found between groups on the spelling test. Kindergarten free writing students outperformed both other groups, and WTR outperformed the controls. First-grade WTR students were better at invented spelling than the controls but not at correct spelling. The ETS study (Murphy and Appel, 1984) found no differences between groups at either level, and Levinson and Lalor (1987) found differences in first grade only. This variance between studies might be explained by the nature of the spelling tests used: in the other studies the tests were derived from first-grade spelling series, but here a test was used which correlated well with reading achievement (Morris, 1983; Morris and Perney, 1984). Second, this is the only study whose population was low-income rather than heterogeneous. Murphy and Appel (1984) found a smaller impact for WTR on minority and low-achieving children with low socioeconomic status, but in the current study the effects were significant. In addition, these results were achieved in spite of Murphy and Appel's statement that "it is rare that school interventions result in significant impact when standardized tests are used as part of the evaluation" (p. 6.11). Finally, the lack of a pretest to equate groups is a flaw in the present study. Groups were able to be matched only on economic and racial variables.

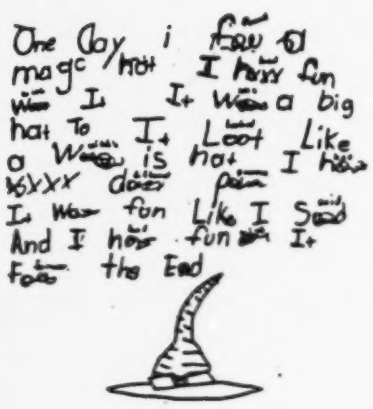
Examples of children's writing at the end of the school year show interesting differences in development. Samples 1-3 are from kindergarten. The writer in Sample 1, from a control class, has progressed to the stage of utilizing beginning sounds, as well as occasional other sounds. This is an important step in understanding the relationship between sounds and letters but is not as fully developed as the skills displayed in Sample 2. This writer, from a WTR class, is not only skilled in using invented spelling but has also internalized the literary convention of a magic rhyme. The author of Sample 3, from a free writing class, also displays an imagination which has probably been fostered by listening to stories read to her. This author is so uninhibited that she uses X's or scribbles to finish out words she does not know how to spell. Samples 4 and 5 from first grade show a similar contrast. In Sample 4, from a WTR class, the child plunges into the assignment by spelling words the way they sound. Thus his story is lengthy and creative, with a ghost, outer space creatures, and a man turned into a frog. Sample 5, from a control class, displays a writer who is interested in language, exploring questions and exclamations, and also imaginative, changing form as she makes her wishes. However, the lack of details and the touch of illogic at the end provide some evidence that this writer is so inhibited by her concern for correct spelling that the content of the story suffers. If children are to progress as writers, they must be free to express whatever they want to say in whatever way they can and they must have been exposed to literature in order to know and understand literary conventions.



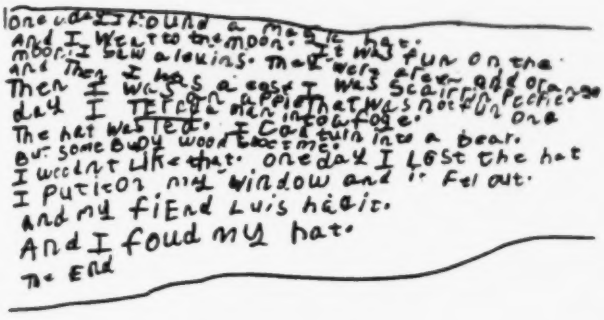
Sample 1



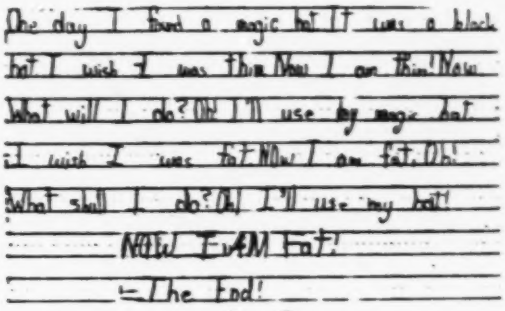
Sample 2



Sample 3



Sample 4


One day I found a magic hat It was a black
hat I wish I was thin Now I am thin! Now
what will I do? Oh I'll use my magic hat
I wish I was fat Now I am fat. Oh!
what shall I do? Oh! I'll use my hat!
Now I am Fat!
The End!

Sample 5

RECOMMENDATIONS

Based on the results found in this investigation, several recommendations can be made.

1) **Composition should be stressed at both the kindergarten and first-grade levels. It should not be a mere incidental and occasional part of the curriculum.** Incorporated properly, in a print-rich environment where writing is shared with an audience, it provides a purposeful integration of all strands of language arts: writing, reading, speaking, and listening. Thus children are helped to utilize all their cognitive and linguistic abilities. "By inviting children to become writers, we give them the opportunity to explore directly both the functions and forms of written language" (Martinez and Teale, 1987, p. 445). As children learn to become phonetic spellers, they not only express their own ideas in a meaningful way and thus communicate with other people but they also learn to read by first segmenting sounds in words and then matching appropriate letters to each sound as they write the words (Morris and Perney, 1984). The kindergarten results in this study seem to confirm that ability to write has an effect on the ability to read.

2) **In order to foster both phonemic awareness and a sense of story, teachers should begin with story dictation in preschool and then actual writing practice and transcription in kindergarten.** The ability to compose in writing consists of the ability to utilize phonetic or invented spelling as well as the ability to create sensible and logical content. It has been seen (Tables 4 and 5) that children who were given opportunities to write received content scores on their writing samples well above the other children. Practice in free writing, then, seems to strengthen knowledge of both letters and sounds and of story schemata.

3) **Extended and continuing inservice training in composition should be provided for teachers of young children to move these children toward literacy.** This recommendation is supported by both the literature on inservice training and the results of this study which showed that the kindergarten free writing group outperformed the other groups. An important difference between kindergarten groups was in the amount of inservice training offered to the teachers. Although WTR teachers had had two consecutive days of training provided by IBM, this training dealt primarily with the mechanics of the program. In contrast, one free writing teacher was familiar with the emergent literacy research and the other four free writing teachers had had several sessions of specialized training in teaching composition over a two-year period as well as extensive monitoring over the same period. This training explained the writing process and provided practical suggestions for implementation. Control teachers had had no inservice training, except that in two schools a staff member had provided a limited amount of assistance. Bruce Joyce, an experienced trainer of teachers, uses the word "coaching" in connection with teachers learning new skills. "We had strong evidence that if we combined study of the rationale of a teaching strategy or curriculum with demonstrations of it, plus lots of practice and lots of feedback, almost any teacher could learn almost any approach to teaching.... You start with lots of training--and you <u>continue</u> the training" (Brandt, 1987, pp. 12-13). Dodd (1987) suggests that, if a

district can't afford to hire consultants to work with teachers on a continuing basis, time should be provided "for teachers to come together in an informal learning community where they can support and encourage each other" (p. 30). In the case of the control group, especially, it would seem unrealistic to distribute a composition handbook and then not follow it up with extended training.

4) **WTR appears to develop children's word analysis skills, but a pencil and paper approach appears to develop additional skills as well.** A basic evaluation question of this study was also posed by Wallace (1985, p.23): "Given the expense of WTR, in personnel, time, hardware, and materials, could equal or better results be obtained though other means?" Based on the results, the answer to this question seems to be that an expensive program with computers is unnecessary to help young children learn to compose, read and spell.

5) **To fairly assess the effectiveness of WTR, another comparative evaluation should be made at the end of its second year of implementation, at the end of fiscal 1989.** Because of WTR implementation problems, other researchers conducted their studies during a second year of implementation, after such problems had been corrected (Murphy and Appel, 1984; Naron and Sierra, 1988; Sierra and Naron, 1988). It should be pointed out, however, that in the Naron and Sierra reports, second-year results corroborated those of the first year.

6) **Finally, certain procedures should be followed in helping young children learn to compose.**

(a) **Children should be allowed to write freely and express their own thoughts** so that they remain interested in what they do and learn to communicate with others.

(b) **Children should put the date on all pieces of writing and their writing samples should be kept together in individual folders. In this** way, teachers and parents can see the progress made by children simply by comparing pieces from November and April, for instance.

(c) **Children should be allowed to use their own invented spellings as they write about what interests them** so that their phonics skills are fully utilized and their fluency is not interfered with by an undue concern with correctness.

(d) **As much writing as possible should be transcribed by teachers as the children read it** so that they understand the relationship between sound and print and develop a sense of audience.

(e) **Children's writing should be displayed at their own eye level** so that other children can read the writing and participate in the communication process as well as offer positive feedback to the authors.

(f) **Classrooms should be immersed in print.** Characteristics of whole language classrooms are library books, experience stories, Big Books, children-made books, library cards, constant availability of writing materials, sentence labels dictated by children, letters written to and by teachers, stories read and dramatized, comfortable and secluded free-

reading corners, note-pads and forms to fill out in play areas and learning centers, pen pals from other classes, and authors of the week. As Lucy Calkins explains (1986, p.235),

> Language cannot be poured, ready-made, into children. [It] is not content that can be taught so much as skill that can be developed. Most language-learning occurs through self-generated, functional, holistic activities; through approximation and error; through bonded relationships with people who are joyfully literate. This understanding of language-learning challenges traditional images of teaching, learning, and classrooms, while it focuses attention on language learners, and on ways we can nurture, guide, and extend their processes.

REFERENCES

Brandt, R.S. (1987). On teachers coaching teachers: a conversation with Bruce Joyce. Educational Leadership, 44, 12-17.

Butler, Andrea and Jan Turbill (1985). Towards a Reading-Writing Classroom. Crystal Lake, IL: Rigby Education.

Calkins, Lucy McCormick (1986). The Art of Teaching Writing. Portsmouth, NH: Heinemann.

Clarke, Linda K. (1988). Invented versus traditional spelling in first graders' writings: effects on learning to spell and read. Research in the Teaching of English, 22, 281-309.

Dodd, Anne Wescott. Getting results from a one-day inservice program. Principal, 66, 29-30.

Goldring, Ellen B. and Laurie S. Presbrey (1986). Evaluating preschool programs: a meta-analytic approach. Educational Evaluation and Policy Analysis, 8, 179-188.

Karweit, Nancy L. (1987). Full or Half Day Kindergarten--Does It Matter? Baltimore: Johns Hopkins University Center for Research on Elementary and Middle Schools.

Karweit, Nancy L. (1988). A research study: effective preprimary programs and practices. Principal, 67, 18-23.

Levinson, Judith and Ida Lalor (1987). Writing to Read Program: Progress Report, 1987. Evanston, IL: School District 65.

Martin, John Henry (1984). Less incidence of dyslexia when children write before they read? Early Years, 15, 30,33.

Martinez, Miriam and William H. Teale (1987). The ins and outs of a kindergarten writing program. The Reading Teacher, 40, 444-451.

Morris, Darrell (1983). Concept of word and phoneme awareness in the beginning reader. Research in the Teaching of English, 17, 359-373.

Morris, Darrell (1986). Teaching Reading in Kindergarten: A Language-Experience Approach. Evanston, IL: National College of Education.

Morris, Darrell and Jan Perney (1984). Developmental spelling as a predictor of first-grade reading achievement. The Elementary School Journal, 84, 441-457.

Murphy, Richard. T. and Lola R. Appel (1984). Evaluation of the Writing to Read Instructional System: Second Year Report. Princeton, NJ: Educational Testing Service.

Naron, Nancy K. (1981). The need for full-day kindergarten. Educational Leadership, 38, 306-309.

Naron, Nancy K. and Rita Sierra (1988). A Follow-Up Study of the Use of Different Strategies to Promote Writing Ability in Young Children. Paper presented at the annual meeting of the American Educational Research Association.

National Assessment of Educational Progress (1981). Reading, Thinking and Writing. Denver: Education Commission of the States.

National Assessment of Educational Progress (1987). The Writing Report Card: Writing Achievement in American Schools. Princeton, NJ: National Assessment of Educational Progress.

Puleo, Vincent T. (1986). Current research perspectives on full-day kindergarten. ERS Spectrum, 4, 32-37.

Puleo, Vincent T. (1988). A review and critique of research on full-day kindergarten. The Elementary School Journal, 88, 427-439.

Scarr, Sandra and R.A. Weinberg (1986). The early childhood enterprise: care and education of the young. American Psychologist, 41, 1140-1146.

Sierra, Rita and Nancy K. Naron (1988). Evaluating the Writing to Read Program: Seeking the Ghost in the Machine. Paper presented at the annual meeting of the American Educational Research Association.

Spillman, Carolyn V. and Jay P. Lutz (1986). A Writing To Read philosophy. Childhood Education, 62, 265-268.

Teale, William H. and Elizabeth Sulzby (1986). Emergent Literacy: Writing and Reading. Norwood, NJ: Ablex.

Wallace, James M. (1985). Write first, then read. Educational Leadership, 42, 20-24.

Zenke, Larry L. and Mary Joe Keatley (1985). Progress Toward Excellence: Tulsa's Kindergarten Program. Tulsa, OK: Tulsa Public Schools.